

Year 10 Force and Motion Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 - 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

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- 1. Net force can be calculated by subtracting which force from the larger force?**
 - A. Larger**
 - B. Equal**
 - C. Smaller**
 - D. Zero**

- 2. Which statement correctly distinguishes static friction from kinetic friction?**
 - A. Static friction occurs during motion; kinetic friction stops motion.**
 - B. Static friction prevents motion up to a limit; kinetic friction acts during motion and is usually smaller than static friction.**
 - C. Static friction and kinetic friction are the same.**
 - D. Kinetic friction prevents motion until threshold is exceeded.**

- 3. What is the kinetic energy of a 5 kg cart moving at 2 m/s?**
 - A. 5 J**
 - B. 20 J**
 - C. 8 J**
 - D. 10 J**

- 4. If the same amount of force is applied to two similar objects that have different masses, the smaller object will accelerate _____.**
 - A. Slower**
 - B. Not move**
 - C. Same acceleration**
 - D. Faster**

- 5. In a perfectly inelastic collision, which quantity is conserved?**
 - A. Neither momentum nor kinetic energy is conserved.**
 - B. Both momentum and kinetic energy are conserved.**
 - C. Only momentum is conserved.**
 - D. Only kinetic energy is conserved.**

6. A ball is thrown upward with initial speed 15 m/s. Using $g = 9.8 \text{ m/s}^2$, what is the maximum height reached?
- A. 22 m
 - B. 5.5 m
 - C. 15 m
 - D. $\approx 11.5 \text{ m}$
7. If two horizontal forces acting on an object are equal and opposite, the forces are what?
- A. Unbalanced
 - B. Net Zero
 - C. Balanced
 - D. Resultant Forces
8. Momentum is defined as $p = m v$. On which quantities does momentum depend?
- A. Mass and velocity.
 - B. Time and acceleration.
 - C. Mass and position.
 - D. Force and velocity.
9. How you calculate speed
- A. $v = d/t$
 - B. $t = d/v$
 - C. $S = v d$
 - D. $d = v t$
10. What is a measure of the duration of motion?
- A. Distance
 - B. Velocity
 - C. Time
 - D. Speed

Answers

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1. C
2. B
3. D
4. D
5. C
6. D
7. C
8. A
9. A
10. C

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Explanations

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1. Net force can be calculated by subtracting which force from the larger force?

- A. Larger
- B. Equal
- C. Smaller**
- D. Zero

When two forces act in opposite directions, the net force is found by subtracting the smaller force from the larger one. The resulting net force points in the direction of the larger force, and its size is the difference between the two magnitudes. For example, 8 N to the right minus 3 N to the left leaves a net of 5 N to the right. If the forces are equal, they cancel and the net force is zero. So the force being subtracted from the larger one is the smaller force.

2. Which statement correctly distinguishes static friction from kinetic friction?

- A. Static friction occurs during motion; kinetic friction stops motion.
- B. Static friction prevents motion up to a limit; kinetic friction acts during motion and is usually smaller than static friction.**
- C. Static friction and kinetic friction are the same.
- D. Kinetic friction prevents motion until threshold is exceeded.

Static friction is the force that resists the start of sliding between two surfaces. It can adjust to match the applied force up to a maximum value, so as long as your push is not larger than that limit, the object stays at rest. The maximum static friction depends on how hard the surfaces are pressed together (the normal force) and a coefficient that represents their roughness. Once the push exceeds that threshold, the surfaces begin to slide, and kinetic friction takes over. This friction acts opposite the direction of motion while the object is moving, and it typically has a smaller, roughly constant magnitude compared with the maximum static friction. So the best distinction is: static friction prevents motion up to a limit; kinetic friction acts during motion and is usually smaller than static friction. For example, a book on a table won't slide until your push passes the maximum static friction; once it starts sliding, the resistance drops to a lower, steady kinetic friction.

3. What is the kinetic energy of a 5 kg cart moving at 2 m/s?

- A. 5 J
- B. 20 J
- C. 8 J
- D. 10 J**

Kinetic energy depends on how much stuff is moving and how fast it's moving, specifically $KE = \frac{1}{2} m v^2$. With a mass of 5 kg moving at 2 m/s, the energy is $\frac{1}{2} \times 5 \times (2)^2 = 0.5 \times 5 \times 4 = 10$ joules. So the cart has 10 J of kinetic energy. Because the speed is squared, changing the speed has a big effect on energy: doubling the speed would quadruple the energy. If you tried other energy values, they would require different speeds (for example, 5 J would correspond to about 1.41 m/s, 20 J to about 2.83 m/s, and 8 J to about 1.79 m/s), which don't match the given speed.

4. If the same amount of force is applied to two similar objects that have different masses, the smaller object will accelerate _____.

- A. Slower
- B. Not move
- C. Same acceleration
- D. Faster**

When you push with the same force on objects that differ in mass, acceleration follows $a = F/m$. With the force the same, the lighter object has a smaller mass in the denominator, so the result is a larger acceleration. Inertia is higher for the heavier object, so it resists pushing changes in motion more, meaning it speeds up less under the same push. Therefore, the smaller object will accelerate faster.

5. In a perfectly inelastic collision, which quantity is conserved?

- A. Neither momentum nor kinetic energy is conserved.
- B. Both momentum and kinetic energy are conserved.
- C. Only momentum is conserved.**
- D. Only kinetic energy is conserved.

In a collision, momentum is conserved when there are no external horizontal forces acting during the impact. A perfectly inelastic collision is when the two objects stick together, so they move with a common final velocity. The total momentum before the collision equals the total momentum after: $m_1*v_1 + m_2*v_2 = (m_1 + m_2)*V$. This is why momentum is conserved in this scenario. Kinetic energy, on the other hand, is not generally conserved in inelastic collisions. Some of the initial kinetic energy is transformed into other forms of energy—such as heat, sound, and permanent deformation of the objects—so the final kinetic energy is typically less than the initial kinetic energy.

6. A ball is thrown upward with initial speed 15 m/s. Using $g = 9.8 \text{ m/s}^2$, what is the maximum height reached?

- A. 22 m
- B. 5.5 m
- C. 15 m
- D. $\approx 11.5 \text{ m}$**

Gravity slows the ball as it rises, and at the top its vertical speed becomes zero. Using $v^2 = v_0^2 - 2g h$ with $v = 0$, the height is $h = v_0^2 / (2g)$. With $v_0 = 15 \text{ m/s}$ and $g = 9.8 \text{ m/s}^2$, $h = 225 / 19.6 \approx 11.48 \text{ m}$, about 11.5 meters.

7. If two horizontal forces acting on an object are equal and opposite, the forces are what?

- A. Unbalanced**
- B. Net Zero**
- C. Balanced**
- D. Resultant Forces**

When two horizontal forces on an object have equal strength but point in opposite directions, they cancel each other out. The total net force is zero, so the object experiences no acceleration and keeps moving how it was already moving (or stays at rest). This situation is described as balanced forces. If the forces weren't equal, there would be a net force and the object would accelerate.

8. Momentum is defined as $p = m v$. On which quantities does momentum depend?

- A. Mass and velocity.**
- B. Time and acceleration.**
- C. Mass and position.**
- D. Force and velocity.**

Momentum depends on mass and velocity because it is the product $p = m v$. If you increase the mass while keeping velocity the same, momentum goes up; if you increase velocity with the same mass, momentum also goes up. Time, acceleration, position, or force don't set the current momentum directly (time and acceleration describe how momentum changes, and force relates to that change via $F = dp/dt$). In short, the current momentum is determined by how much matter there is (mass) and how fast it's moving (velocity).

9. How you calculate speed

- A. $v = d/t$**
- B. $t = d/v$**
- C. $S = v d$**
- D. $d = v t$**

Speed tells us how far something travels in a given amount of time. The direct way to calculate it is by dividing distance by time, so speed equals distance divided by time. If you know distance and time, you compute speed with $v = d/t$. You can also rearrange this to solve for time ($t = d/v$) or for distance ($d = v t$), but when the question asks how you calculate speed, the simplest and most direct expression is $v = d/t$. For example, traveling 120 meters in 30 seconds gives a speed of $120/30 = 4$ m/s.

10. What is a measure of the duration of motion?

A. Distance

B. Velocity

C. Time

D. Speed

Time is the measure of how long motion lasts. It tells you the duration from the start to the finish of a movement. Distance describes how far something travels, not how long it takes. Speed is how fast something moves—distance divided by time—so it's about rate, not the length of time itself. Velocity is speed with a direction, still focusing on rate rather than total time. In practice, you'd use a stopwatch to capture the duration, for example, how many seconds it takes to run 100 meters.

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Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

<https://yr10forceandmotion.examzify.com>

We wish you the very best on your exam journey. You've got this!

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